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PRELIMINARY REPORT OF OPERATION DEEP FREEZE 1963

ROSS SEA OCEANOGRAPHIC SURVEY

The U. S. Naval Oceanographic Office, supported by a National Science Foundation grant, conducted oceanographic research in the true Antarctic during the austral summer of 1962-63. The survey was accomplished aboard USS EDISTO (AGB-2), and 122 oceanographic stations were occupied as follows:

6 February through 12 February - 25 ocean stations

15 February through 20 February - 22 ocean stations

22 February through 2 March - 41 ocean stations

5 March through 10 March - 24 ice forecast stations

10 March through 12 March - 10 ocean stations.

Figure 1 shows the location of oceanographic stations in the western portion of the Ross Sea. It will be noted that twelve of the ice forecasting potential stations are in the same position as previously occupied standard oceanographic stations. During the conduct of this survey, EDISTO determined the corrected positions for the Ross Ice Shelf front from Ross Island eastward to about 180° longitude.

The oceanographic survey program was divided into two phases:

(1) occupation of a series of standard oceanographic stations with a station interval of approximately 30 miles, and (2) occupation of specific stations after 1 March 1963 for ice forecasting potential. During both phases, NAVOCEANO personnel made standard oceanographic station observations, and collected bottom sediment and biological samples.

Serial oceanographic data were collected with Nansen bottles placed at preselected depths extending from the sea surface to the bottom. Temperatures were measured with paired protected reversing thermometers, and depth was determined by geometry of the wire rope and/or by thermometric computations based on protected and unprotected reversing thermometers. Serial salinity, dissolved oxygen

and nitrogen, and inorganic phosphate water samples were obtained, and analyses were performed aboard ship. Salinity values were determined by the inductively - coupled salinometer method, dissolved oxygen and nitrogen by the NAVOCEANO modification of the Swinnerton-Linnenbom-Cheek gas chromatographic method, and inorganic phosphate by Strickland and Parsons spectrophotometric method. Serial sea water samples also were frozen and shipped to the U.S. Naval Oceanographic Office Laboratory for nitrate-nitrite and silicate analyses. Data from these observations are being processed and evaluated, and the results will be published as a NAVOCEANO Technical Report.

Surface biological samples (plankton) were collected with a stramin net, and bottom biological samples were taken with a triangular dredge and a crab trap. Plankton samples were preserved in formalin, and bottom biological samples were either frozen or preserved in formalin or alcohol.

Bottom sediments were collected with several devices: a PVC corer using a Phleger corer as a trigger weight, a PVC corer used separately, a Phleger corer, an orange peel bucket sampler, and a triangular dredge.

In addition to the foregoing, organic and inorganic debris were collected at Cape Adare, Cape Hallett, and Ross Island for thermophilic mycoflora examination; special oceanographic casts were made to obtain water samples for geochemistry trace element studies, and bottom biological samples were taken for paleoecological investigation.

A summary of observations made during Operation DEEP FREEZE 1963 is presented in Table 1.

TABLE 1
SUMMARY OF OCEANOGRAPHIC OBSERVATIONS
OPERATION DEEP FREEZE 1963

Type of Observation or Sample	Recipient	Number
Oceanographic Stations.....	NAVOCEANO*.....	122
Serial Temperature/Salinity.....	NAVOCEANO*.....	1793
Serial Dissolved Oxygen/Nitrogen.....	NAVOCEANO*.....	1290
Serial Inorganic Phosphate.....	NAVOCEANO*.....	930
Serial Nitrate-Nitrite and Silicate (Frozen).....	NAVOCEANO*.....	45
Bottom Sediment Cores.....	Florida State University.....	16
Bottom Sediment Samples.....	Florida State University.....	29
Plankton Tow Samples.....	National Museum.....	19
Organic/Inorganic Debris Samples.....	Boyce Thompson Institute For Plant Research.....	13
Geochemistry Trace Element Samples.....	Science Council of Japan....	43
Paleoecological Bottom Samples.....	California Institute Of Technology.....	5

* Data will be transferred to the National Oceanographic Data Center when processed.

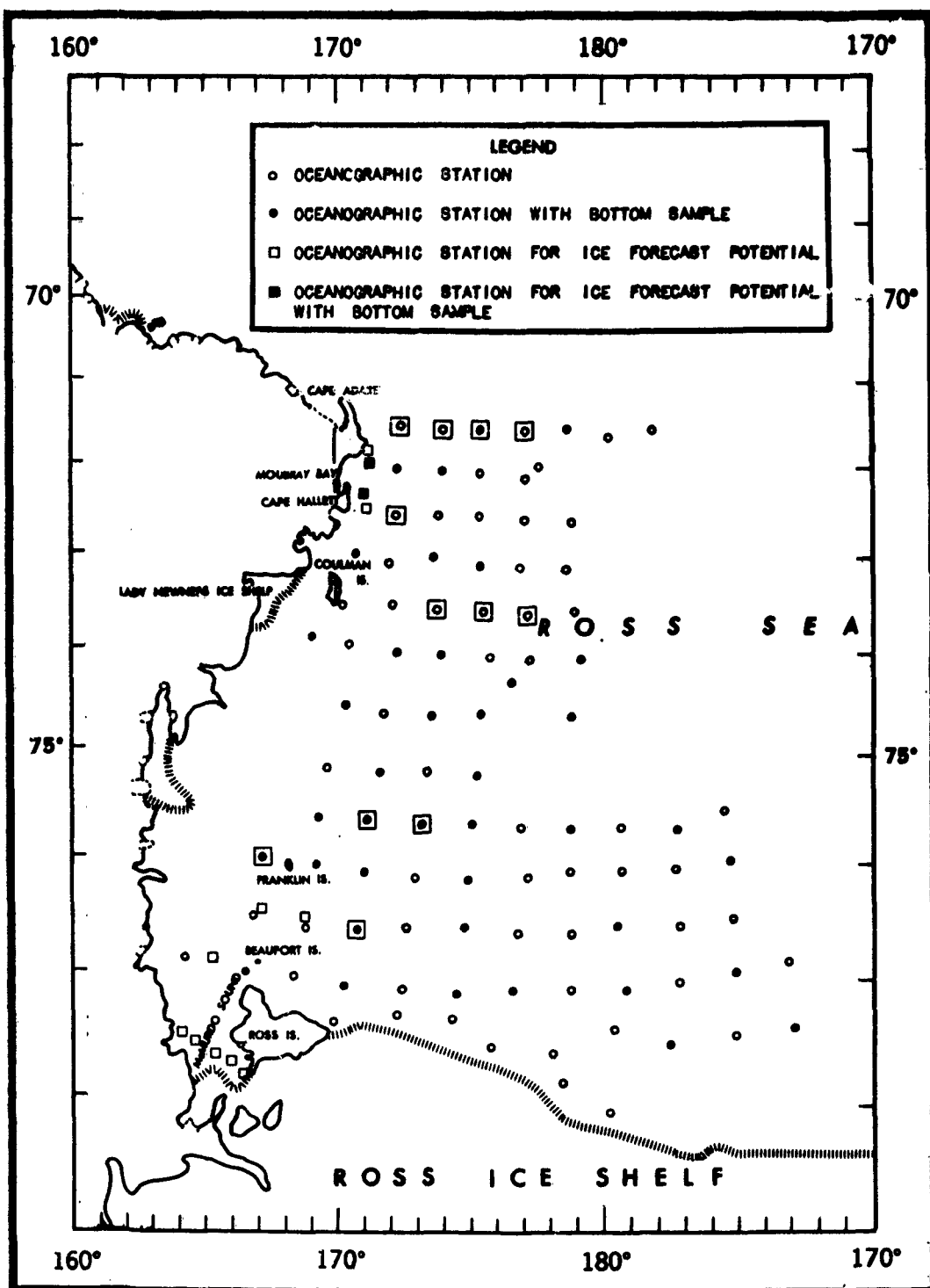


FIG.1. STATION LOCATION — DEEP FREEZE 1963